MAXWELL JONES

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I'm a Artificial intelligence and math double major at Carnegie Mellon University, graduating in 2023. I'm interested in AI/ML as well as software engineering.

Skills

PROGRAMMING LANGUAGES

Python
Java
C
Javascript
HTML/CSS
LaTeX
SQL
Julia

TOOLS/FRAMEWORKS

NumPy
Pytorch
SciPy
Unix Command Line
Git
Sklearn
Keras
Pandas
Jupyter Notebook
regex
Matplotlib

COURSEWORK

15-485 Intro to Deep Learning
16-385 Computer Vision
10-703 Deep Reinforcement Learning
10-725 Convex Optimization
10-315 Intro to Machine Learning
15-281 Artificial Intelligence
15-210 Parallel Algorithms
15-213 Computer Systems
21-484 Graph Theory
15-251 Theoretical Computer Science

HOBBIES/INVOLVEMENT

Origami
Chess
Basketball
Kappa Sigma Fraternity

Education

Thomas Jefferson High School for Science and Technology — Sept. 2015 to May 2019
High School Diploma 2019
GPA: 4.1/5.0

Carnegie Mellon University — Sept. 2019 to Current
BS Mathematics 2023
BS Artificial Intelligence 2023
GPA: 4.0/4.0

Employment

Meta | FAIR Labs
Software Engineer/Machine Learning Intern — May 2022 to Current

- Working on paper to systematically benchmark algorithmic **Bias Amplification** of models from biased datasets with different levels of bias
- Measuring how the affects of a a specific feature in an image(ex: grass versus snow) may affect classification of an object(ex: dog versus wolf)
- Using **ResNet-18** using **ClassyVision** and **Pytorch** to benchmark bias for controlled subsets of **The Visual Genome** dataset
- Specifically, creating custom biased datasets, running experiments, and **Cleaning Data** for **Image Classification**
- **Lead Team Meetings** every week with respect to the project, specifically peers and co-authors on **Computer Vision** FAIR team

Meta | Probability and Uncertainty — Remote
Software Engineer Intern — May 2021 to Aug. 2021

- Developed a data perturbation training/evaluating/testing pipeline in **Python** for the Probability: Uncertainty team, leveraging **Pytorch** for main testing
- Tested on probabilistic models including **Bayesian**, **Ensemble**, and **Dropout** focused networks modeled off of **LeNet-5** for performance
- Measured how well these probabilistic models performed on perturbed image data(**Random Cropping, Rotation, Jittering**) w.r.t non-probabilistic models
- Created visualizations using **Matplotlib** for presentation
- Specifically focused on **MNIST** and **FashionMNIST** datasets, comparing different model architectures

Carnegie Mellon University
(Head) Teaching Assistant — Fall 2020 to Current

- Teaching Assistant for 15-251 Theoretical Ideas in Computer Science, head TA for 15-151 Concepts of Mathematics (Spring and Fall, respectively)
- Teach 20-student recitation twice per week, host office hours, and lead review sessions
- Design/Lead staff meetings, coordinate TA-Professor interactions, **delegate TA responsibilities** for Concepts
- Help **design exams**/update problem sets, **update course structure** for Concepts

Fiat Chrysler Automobiles — Remote
Data Science Intern — May 2020 to Aug. 2020

- Tasked to increase accuracy for absentee worker prediction at all plants (absentee predictions inform numbers for necessary temp workers)
- Improved performance by using **Random Forests,** cross referencing crew attendance across plants
- Queried data from **PostgreSQL** database and used **Pandas** library to store query results
- Optimized the HR absentee prediction model in Python resulting in a **2% increase in accuracy**

Projects

Semi Supervised Learning Research, Carnegie Mellon University — Fall 2021 to Current

- Currently working on research in scalable graph-based Semi-Supervised Machine Learning project with PHD student under Dr. Nina Balcan
- Using **Python** and **SciPy,** finding **Harmonic Objectives,** leveraging **K-Nearest Neighbor** graphs and iterative solvers for speedup
- evaluating on **MNIST, CIFAR,** and common **NLP** datasets such as 20-newsgroups dataset with **Sklearn** using **Bag of Words** approach
- Achieved **same accuracy, 100x speedup** on large graphs with respect to closed form solutions with matrix inverses
- Used **Image Embeddings** from layer 2 of **Resnet-18** adapted for CIFAR in order to clean up more difficult image classification problem before iterating

Battlecode (codebase) — Jan. 2022

- Worked on team of 4, coding an AI bot in **Java** to compete in a tournament run every year by MIT
- Leveraged **distributed** communication **algorithms** and **pathfinding** to increase bot's effectiveness
- Implemented **bit packing** methods, data structures such as **Priority Queues** and **Stacks,** and **K-Means Clustering** to improve performance
- Placed top 10 out of 250 teams internationally(2021, 2022), 1st out of all first-time teams(2021)

TartanHacks: Spot your Mood! (codebase) — Feb. 2021

- Created an add on for **Spotify** using **Python** and **Flask** on team of 4 to track mood of users listening over time, as well as mood of specific playlists
- Developed **Vector Embeddings** for mood based on **Spotify API** metadata and sentiment anaylsis
- Used **Euclidean Distance** in the **Embedding Space** to execute recommendation decisions
- Functionality for both song and playlist generation based on mood factors and specific genres that users liked
- Developed graphs of mood over time based on users past listening

TartanHacks: WalkSafe! (codebase) — Feb. 2020

- Developed a Python program on team of 4 that calculates safe and efficient walking paths at night in New York City
- Created a weighted graph from crime and street data and implemented an **A* Pathfinding** algorithm to generate optimal paths
- Integrated **Open Street Map API** and fetched data from NYPD crime database REST endpoint